Appendix E: Spill Prevention and Contingency Plan

1.0 PURPOSE OF THE PLAN

This Spill Prevention and Contingency Plan (Plan) was prepared by 448018 Exploration Inc. for use at the Juniper Ridge Project. The Plan should be used as a reference guide and will accompany the project specifications and plans. The main purpose of the Plan is to help contractor personnel prepare for and respond quickly and safely to hazardous spill incidents. If implemented appropriately, the plan will ensure an effective, comprehensive response to prevent injury or damage to the construction personnel, public, and environment during the project.

1.1 Project Definition

The Juniper Ridge Project is defined in the Plan of Operations submitted to the BLM in April 2012.

1.2 Uses and Organization of the Plan

The Plan is to be used to inform Contractors and CXX staff of the potential hazardous materials, contamination prevention, emergency spill response, and responsibilities associated with hazardous materials during The Project. Contractors are expected to comply with all procedures described in this document, as well as explicit instructions given by CXX personnel in emergency situations. Liability for failure to do so rests with the contractor. Any expense incurred by CXX during project construction that results from contractor non-compliance with spill procedures, response, or damage will be passed on to the responsible contractor.

The Plan outlines the responsibilities and procedures when responding to hazardous spills involving CXX contractors on the project. The Plan contents include:

1. General procedures for effective management of spill response within the geographic boundaries of the Project.
2. Identification of management, equipment, and other resources that can be used during a response operation.
3. Specific spill response procedures that provide guidance for spill response planning and operations.
4. Specific notification and reporting procedures for contacting management and governing agencies.

A copy of this Plan shall be distributed to all personnel that may provide assistance during spill response activities for CXX operations.

2.0 HAZARDS ASSESSMENT

The hazardous materials that may be on site during installation include those usually associated with the operation and maintenance of vehicles and machinery, and include diesel fuel, gasoline, hydraulic fluid, brake fluid, antifreeze, and lubricants. Other materials considered hazardous are chemicals used in portable toilets and the associated human waste. There is also the possibility of encountering buried hazardous or toxic materials during construction operations. Each of these hazards is discussed briefly below.

2.1 Vehicle Fluids

The materials associated with vehicle operation and maintenance is hazardous to humans, wildlife, and sensitive environments. Spills of diesel fuel, gasoline, hydraulic fluid, brake fluid, engine oil, lubricants, etc. are considered serious and emergency response procedures must be initiated (See Section 4.2.1). These materials can be toxic to skin, eyes, respiratory system, and internal organs. Toxicity can be transmitted in the form of liquid or vapor. These materials may also be flammable and combustible, and proper precautions must be used in handling spills. Antifreeze, Freon, and other non-petroleum products are also hazardous toxic substances. The same spill prevention and response actions are to be employed with spills of these materials.

Potential sources of spills of vehicle fluids include mobile refueling trucks and construction vehicles and equipment. Potential causes of vehicle fluid spills include: emergency ruptures in fuel tanks or construction equipment; overflow of fuel from the tank during the refueling of equipment; seepage of fuel or lubricants during normal operation or storage; spills of oil or hydraulic fluid, etc. during on-site vehicle and equipment servicing; vehicle accidents; and natural disasters.

2.2 Chemical Toilets and Human Waste

Proper disposal and disinfection of human waste at the construction site is required. Human waste may contain infectious bacteria, pathogens, or other health hazards. Waste must be contained in portable toilets that receive periodic cleaning and disposal of waste. Chemicals used in toilets are also hazardous to wildlife and sensitive environments. Portable chemical toilets could overflow if not pumped regularly or they could spill if dropped or overturned during moving.

2.3 Unknown Hazardous Materials

The potential exists for encountering unknown buried or illegally deposited hazardous materials in the Project area. These may take the form of underground storage tanks, utility pipelines, unmarked drums, septic drain fields and tanks, asbestos pipe, etc. Construction personnel shall be alert to indicators of buried hazardous waste, including partially buried unidentified drums or pipe; encountering unusual resistance with equipment; or encountering unusual or unpleasant odors during construction. If any of these indicators are observed, construction shall stop until the identity of the material encountered is assessed. The hazard associated with unknown buried materials must be assumed to be high due to the unknown nature of the material. Any unknown hazardous materials encountered require special handling and emergency response procedures (See Section 4.2.4).

3.0 SPILL PREVENTION AND CONTAINMENT

3.1 Spill Prevention Measures

The number one defense against spill is prevention. The easiest way to prevent spills is to:

- conduct proper vehicle maintenance and inspections;
- Never place vehicles or equipment in or near sensitive environments,
- And store all materials in protected areas.

3.1.1 Vehicle Fluids

All personnel shall be trained to maintain and inspect their vehicles and equipment. All machinery found to be a potential source of a future spill shall be removed from the construction site and repaired. Vehicles with chronic or continuous leaks must be removed from the construction site and repaired before returning to operations. No leaking of any material from equipment or vehicles will be tolerated on the job site. The contractor shall make every effort to ensure compliance prior to an incident. Contractors are solely responsible for any spills of hazardous materials and the subsequent cleanup, disposal of waste, and restoration of any contaminated areas. Hazardous materials may be disposed of at various sites within Carbon County and non-hazardous materials may be disposed of at the Baggs solid waste site.

Restrictions will be placed on all equipment refueling, servicing, and maintenance supplies and activities. All maintenance materials, oils, grease, lubricants, antifreeze, etc. shall be stored off-site. If they are required during field operations they shall be placed in a designated area away from site activities and in an approved storage container.

No refueling, storage, servicing, or maintenance of equipment shall take place within 100 feet of drainage or sensitive environmental resources to reduce the potential of contamination by spills. No refueling or servicing shall be done without absorbent material or drip pans properly placed to contain spilled fuel. Any fluids drained from the machinery during servicing shall be collected in leak-proof containers and taken to an appropriate disposal or recycling facility. If these activities result in damage or accumulation of product on the soil, it must be disposed of as hazardous waste (see Section 5.1). Under no circumstances shall contaminated soil be added to a spoils pile and transported to a regular disposal site.

During drilling, all vehicles and equipment required on-site shall be parked or stored at least 100 feet away from rivers, streams, wetlands, known archaeological sites, and any other sensitive resource areas. All wash down activities must be accomplished away from sensitive environmental resources.

3.1.3 Unknown Hazardous Materials

Awareness of the potential for encountering unknown hazardous materials, and early recognition of potentially hazardous materials are the best prevention for avoiding emergencies. Contractors shall visually inspect the alignment prior to trenching activities for any evidence of hazardous waste storage appearing above the surface of the soil. Indicators of buried materials include: old vent pipes; concrete pads; portions of drums; pipes; tanks; discolored or stained soils; and evidence of dumping. Contractors must also be alert to encountering buried hazardous waste while trenching or drilling. If any unusual objects are hit, or unusual odors are encountered while trenching or drilling, contractors must investigate the source before proceeding. Should underground tanks or pipelines be encountered, the possibility exists for flammable materials, toxic fumes, or explosion. Trenches should be considered “confined space” when potentially hazardous materials are discovered (see Appendix B).

3.2 Spill Containment Measures

Several measures can be taken to prepare for quick and effective containment of any potential spills prior to undertaking construction activities. First and foremost, each contractor shall keep adequate supplies of spill containment equipment at the construction sites. These shall include both specialized spill containment equipment (listed below in Section 3.3 “Spill Containment Equipment”) and excess supplies of straw bales, silt fencing, and portable vacuum pumps, to be available as needed.

Other spill containment measures include using drip pans and/or absorbent materials underneath vehicles and equipment every time refueling, servicing, or maintenance activities are undertaken.

3.3 Spill Containment Equipment

The following equipment shall be on-site with each construction crew in the event prevention techniques are not adequate and a spill does occur.

1. Emergency Spill Kit - (general contents may vary with manufacturer) contains at a minimum:

   a) Three sorbent socks

   b) Three disposal bags and ties c) one pair of safety glasses

   d) One pair of rubber gloves e) one sorbent drip pillow

   f) Sorbent pads, 18" x 18"

   g) One Emergency Response Guide Book h) two sorbent spill pillows, 24" x 18"

   I) four hazardous labels

   j) One bag Lite-Dri Absorbent (or equal)

   k) Dedicated shovel and broom

2. Absorbent Pads - These pads (18" x 18") are 100% polypropylene fabric that absorbs 11 times their weight in liquids. Pads absorb 10 gallons of liquid per bale of 100 pads. Each crew will have 100 absorbent pads.

3. Absorbent Skimmers Booms - Skimmers will float indefinitely before or after saturation with oils. Skimmers are made of 100% meltdown polypropylene fill that repels water. They absorb ten times their weight and can be used in lakes, streams, or on the ground. Each skimmer has a harness kit attached that is made of yellow polypropylene rope with grommets that are used to connect skimmers. Each boom is 8 ft. x 10 ft. No absorbent skimmer booms will be required because no water bodies are within this project.

4. One 55 gallon clean drum, lined with polypropylene material (overpack). The drum can be used to store spill response materials until needed. When a spill occurs, all soiled pads, pillows, skimmers, contaminated soil, etc. shall be placed in the drum for disposal after the cleanup is accomplished.

It is the contractor's responsibility to make sure these materials are on-site at all times and personnel are trained in their use and disposal prior to spill response.

4.0 EMERGENCY RESPONSE PROCEDURES

4.1 Initial Notification and Activation

A formal notification process shall be initiated when a spill or potential spill is first observed. Immediate actions are necessary. The first individual who discovers a spill (spill observer) will be responsible for initiating notification and response procedures. All personnel responsible for responding to spills must have completed training in recognition and response to spills of hazardous materials. The contractor is responsible for providing spill recognition and response training for all contractor employees. CXX will be responsible for providing spill recognition and response training for all their project personnel. The project personnel who must be notified and will assist in hazardous spill response include, but are not limited to:

1. Spill Observer
2. Contractor's Job Superintendent
3. Senior CXX person on site
4. CXX Project Manager
6. Spill Response Team

General responsibilities of the designated personnel are outlined as follows:

Spill Observer is the first person to witness a spill. They must immediately:

1. Make an assessment of the incident as observed;
2. If the incident can be safely controlled, take steps to do so. For example, shut off the source of spill;
3. Notify the Contract Compliance Inspector. Provide as much information as possible;
4. Begin to fill out the Spill Notification Checklist (Appendix A).

Drill site geologists will be assigned to drill crews. The drill site geologist will initiate the following actions:

1. Notify the CXX Project manager;
2. Make sure all personnel are removed from the spill area;
3. Take immediate steps to minimize any threat to public safety (cordon off the spill area); and
4. Monitor contractor's personnel.

Contractor's Representative is the Contractor's Job Superintendent, or other Contractor personnel designated to fulfill the Contractor's responsibilities. They will:

1. Determine if the spill response team is needed to accomplish cleanup;
2. Determine if additional spill response support is necessary;
3. Coordinate with the senior CXX employee on site to initiate spill response;
4. Initiate Spill Response Team;
5. Complete containment, cleanup and disposal of hazardous waste;
6. Complete Spill Notification Checklist (Appendix A); and
7. Complete all reporting to CXX and Drill Site Geologists.

The Project Manager will:

1. Coordinate with the Contractor's Representative regarding level of spill response required;
2. Notify governmental agencies if necessary.

The Spill Response Team is composed of Contractor employees or outside companies hired by the Contractor who is designated to respond to spills. The Spill Response Team will:

1. Follow the Spill Response Flow Chart (Figure 1);

2. Follow the specific spill response procedures outlined in the Plan; and

3. Take direction from the Contractor's Representative for additional actions needed for spill response.

4.2 Specific Response Procedures

Specific response procedures have been developed for various kinds of spills including vehicle fluid spills; chemical toilet and human waste spills; and discovery of an unknown hazardous material. Some response procedures common to all spills are to keep people away from the spilled material, secure the source of the spill if this can be done safely, and determine the material spilled and the volume, extent, and potential for danger of the spill. Follow the steps outlined in the Spill Response Flow Chart (Figure 1), and the Spill Notification Checklist (Appendix A).

The first step at the discovery of any spill is keep people away from the spilled material. Close off the area and do not leave the site unattended.

Securing the source of the spill is an extremely important step in response activities. However, a source should be secured only if it can be performed safely without risk to human life or health. Steps to be taken to secure the source include turning off machinery, clamping or disabling hoses, etc.

The second step at the discovery of any spill is to fill out the Spill Notification Checklist (Appendix A). Another key element in early response to all spills is determining of the type of material spilled and the volume and extent of the spill. These facts should be determined as soon as possible in order to facilitate planning and initiate proper response operations. The volume will be needed to evaluate equipment and personnel needs, as well as requirements for storage and disposal of recovered waste. A rough estimate of the spill volume can be generated from visual observation and source identification. Minor spills are those that have the least probability of environmental damage, not necessarily the smallest volume.

4.2.1 Vehicle and Machinery Spills

Incidents of loss of a petroleum product from equipment or vehicles shall be considered a spill. After the spill has been flagged to warn people to stay away, the volume and extent of the spill estimated, and initial notification procedures accomplished, the spill must be confined. Do not handle materials without wearing protective clothing (i.e. gloves, etc.). Use the Spill Response Flow Chart to determine the level of cleanup and response team necessary to handle the incident (Figure 1).

Generally follow the steps listed below:

1. When the spill is discovered begin making notations on the Spill Notification

   Checklist.

2. Determine if the Spill Team Response is needed to complete cleanup.
   a) If the answer is NO, submit incident reports to CXX and the Project Manager.

   b) If the answer is YES, go to step 3.

3. Activate the local spill response team. Generally these are personnel designated on a construction crew, but the team may be supplemented by other contractor personnel.

4. Determine if additional cleanup contractors are necessary for a major incident.

a) if the answer is NO and the incident is determined to be a minor spill, conduct internal cleanup, review and evaluate the cleanup, determine if the cleanup is beyond the local response team ability or equipment; if the answer is NO, complete the cleanup, restore the damaged areas, properly dispose of all waste, and submit incident reports to CXX and the Project Manager. If during cleanup, the incident is determined to be beyond the abilities of the local response team, hire additional contractors to help with the cleanup.

b) If the answer is YES, hire additional contractors to help with the cleanup.

5. The local spill response team shall coordinate cleanup activities with CXX, the Project Manager, and agencies as appropriate.

6. Arrange for proper testing (if substance is unknown, Intermountain Labs in Sheridan or other laboratories within Wyoming and Colorado is potential testing facilities) and disposal of all waste.

7. Closely monitor all cleanup activities.

8. Ensure proper disposal of absorbent materials, containers, and soils, as required.

9. Complete the cleanup and restore damaged areas.

10. Submit incident reports to CXX and the Resident Project Engineer.

Cleanup may range from very simple removal of minor spills, to installation of skimmers around large spills or between sensitive areas and spills for longer, prolonged cleanups. Cleanups can be on pavement or on soil surfaces. Contractor personnel shall be trained in the proper use of the cleanup materials.

All spills on pavement shall be thoroughly removed with absorbent socks, pillows, or pads and Lite-Dry (or equal) granules. After absorption the granules shall also be removed. All materials used in cleanup, shall then become hazardous waste. Place all materials in a 55 gallon lined drum, seal it, and label the contents. The drum must then be sent to a designated disposal site. A chain of custody form must accompany the drum (provided by Disposal Company). It is strongly recommended that all contractors determine a disposal site in advance of a spill incident.

All spills on soil require the same treatment as on pavement, with the exception that contaminated soil is also part of the generated hazardous waste and must be handled as such and removed from the site.

Absorbent materials shall remain in use until it has been determined by the CXX and Contract Compliance Inspectors that a spill cleanup is complete and the incident is closed.

4.2.2 Chemical Toilet Spill

Chemical toilets are self-contained and pose little threat to the construction site. Chemicals used in portable toilets are biodegradable and generally non-toxic to humans. However, they can pose a danger to wildlife and sensitive habitats by virtue of heavy concentration of chemicals and human waste. They shall be pumped out at least one time per week. Toilets shall never be placed in or near an environmentally sensitive area.

In the unlikely event that a portable toilet spills during transport or relocation, the same procedures for other hazardous material spills shall be used. Disposal of absorbent materials shall be handled the same as other spills, with proper disposal by the toilet supply company.

4.2.3 Unknown Hazardous Materials

There is always a possibility that personnel may unexpectedly encounter a hazardous situation when working in the field. The most likely materials that may be encountered during excavation would be buried underground tanks, utility pipelines, drums, or asbestos pipe.

If there is any doubt regarding the degree of hazard of a particular circumstance and personnel are unsure as to what measures to take, the following steps shall be taken immediately to ensure the health and safety of the personnel involved.

1. STOP WORK IMMEDIATELY.
    - Personnel shall remove themselves from the hazard or suspected area.
2. OBTAIN AS MANY DETAILS OF THE SITUATION AS POSSIBLE, WITHOUT ENDANGERING YOURSELF OR OTHERS.

    a) While obtaining information details:
    - Never enter confined spaces (i.e. excavation trench).
    - Do not handle any materials.
    - Extinguish all flames (i.e. welders, torches, cigarettes).
    - Do not remove objects from trenches or refill excavated area.

    b) Things to note:
    - Site location/address or closest Cross Street and station.
    - What was encountered (i.e. tank, drum, pipe, sewage, etc.).
    - Approximate size of object.
    - Odors or any discoloring of soils.
    - Material object is made of (i.e. steel, fiberglass, plastic, etc.).
    - Was there or is there a potential for a spill, release, discharge, etc. of toxic or hazardous liquid, gas, vapor, dust, or mist?
    - Estimated amount of chemical released.
3. CONTACT SUPERVISORS IMMEDIATELY
4. IF YOU MUST LEAVE THE SITE TO NOTIFY SUPERVISORS:
    - Appoint personnel to police the site until you return.
    - Mark off area of concern (i.e. flagging, cones, etc.).

- Do not allow anyone to enter the site.

Following these actions, personnel shall be given proper direction from supervisors on how to proceed. By simply removing personnel from the hazard and maintaining good communications, many accidents can be avoided. Remember if there is any doubt about the safety of on-site employees in particular circumstances; initiate the proceeding course of action.

4.3 Reporting of Major Spills

Upon recognition of a major spill, notification is critical to immediate response. Notification shall be given to the nearest construction crew supervisor and the CXX employee so that appropriate spill response can begin immediately. After initial spill response has begun, notification and reporting to agency personnel shall occur. The following guidelines should be followed when reporting major spills:

1. Never include information that has not been verified;
2. Never speculate as to the cause of the incident or make any acknowledgment of liability;
3. Do not delay reporting because of incomplete information;
4. Notify persons/agencies and document notification and the content of the message; and
5. Complete the Spill Notification Checklist as information is confirmed

The agencies to be notified will vary depending on the spill location. Appendix A contains a listing of the agencies requiring notification, along with contact names and numbers.

5.0 CLOSING OF THE SPILL INCIDENT

5.1 Disposal of Waste

Following the cleanup of a spill, the waste, absorbent materials, protective clothing, and any soil that has been contaminated must be removed to a designated hazardous waste disposal area. All contaminated materials shall be sealed in 55 gallon drums and labeled with the contents. If the contaminant is unknown, a sample of the material must be collected and analyzed before disposal. A permit or approval in writing must be obtained prior to disposal of the drum. A copy of the permit and a chain-of-custody form (obtained from the disposal contractor or testing laboratory) must accompany the material and copies must be attached to the Spill Notification checklist submitted to CXX and the Project Manager. It is advisable for contractors to establish a relationship with a disposal facility before an incident occurs. Local landfills may be able to receive some petroleum products. However, it is up to the contractor to perform sampling, testing, and coordination with landfills or a disposal company. Transporting hazardous waste is regulated by federal and state agencies under the Resource Conservation and Recovery Act (RCRA) and other statutes. The contractor is responsible for the proper disposal of all waste and understanding the responsibilities under federal and state statutes.

5.2 Final Reporting

Spill incidents that require cleanup must be reported on the Spill Notification Checklist. Notification must begin as soon as the incident occurs. The checklist shall be submitted to CXX and the Project Manager as soon as it is complete. Forms must be submitted no longer than five days after an incident is closed. A copy of the permit or disposal approval and the chain-of- custody for the disposal must be attached to the Spill Notification Checklist. The forms shall be reviewed and filed in the contractor's file. No exceptions will be tolerated.

If a situation arises involving an unknown hazardous material, the Spill Notification Checklist can be used to report the incident. This incident may require a very different approach to removing the hazard and the contractor may be required to remove the material. The incident must still be reported by the contractor.

5.3 Follow-up Investigation

A critique following a spill response is beneficial to evaluate the actions taken or omitted. Recommendations and suggested modifications will be made to prepare for the possibility of future spills. Should a contractor have an abnormally high incident of spills, corrective actions may become necessary. Contractors should consider the following examples of questions that are likely to be appropriate at each stage of a critique:

Detection

- Was the spill detected promptly?
- How was it detected and by whom?
- Could it have been detected earlier?
- How?
- Are any procedures available to consider which might aid in spill detection?

Notification

- Project Manager?
- Were proper procedures followed in notifying CXX and the Resident Project
- Agencies?
- Were notifications prompt?
- Was management response appropriate?
- Was the Engineer notified promptly? If not, why not?

Assessment/Evaluation

- Was the magnitude of the problem assessed correctly at the start? What means were used for this assessment?
- Was there adequate measurement or estimation of the spill volume? What was the initial strategy for response to this spill?
- Is the strategy defined in the spill plan?
- How did the strategy evolve and change during this spill and how were these changes implemented?
- What caused such changes?
- Are there improvements needed? More training? Response
- What steps were taken to mobilize spill countermeasures? What resources were mobilized?
- Was mobilization prompt?
- Could it have been speeded up or should it have been? How could this be improved?
- Were outside spill contractors needed and called in promptly? Was containment effective and prompt?
- How could it have been improved?

Command Structure

- Who was initially in charge of spill response? What sort of organization was initially setup? Was there adequate surveillance?
- Were communications adequate? What improvements are needed? Is more planning needed?
- What are the roles and effects of the various government agencies involved? Were government agencies adequately informed at all stages?
- Were too many agencies involved?
- Was there adequate agreement with the government agencies on cleanup criteria? How was this agreement developed?

All contractors and subcontractors are responsible for their actions. CXX and the Project Manager will provide guidance and recommendations, if necessary. Contractors shall be liable for any costs incurred by CXX or the Project Manager as a result of their negligence regarding hazardous materials.

SPILL NOTIFICATION CONTACT LIST

Pursuant to Chapter 4 of the WWQRR, the following spills/releases are reportable to the DEQ:

1. Releases of "oil" and "hazardous substances" which enter waters of the state.
2. Releases that are determined to be a threat to enter waters of the state and are: a) considered a "hazardous substance", or b) any amount greater than either 10 barrels of any combination of crude oil/petroleum condensate/produced water OR 25 gallons of refined crude oil products.
3. Suspected releases from above or underground storage tanks are regulated by Chapter 17, WWQRR. For more information on underground storage tanks, click here.
4. Please note that non-reportable spill events are still required to be addressed immediately by containing, removing, and disposing of the released product according to DEQ regulations.

The following information is provided as a convenience. No warranty on the accuracy or completeness is given nor should be assumed. The contractor is responsible for compiling the appropriate spill response agency contact information for their work.

Spill Reporting and Response		
Agency	**Government**	**Contact**
Dept Environmental Quality	State	(307) 777-7781
Environmental Protection Agency	Federal	(303) 293-1788
National Response Center	Federal	(800) 424-8802
Emergency Management Coordinator	Carbon County	(307) 328-2750
Baggs Volunteer Fire Department	Baggs	(307) 383-7335

SPILL CHECK LIST

Date: _____ Time: _____

Name: _____ Contractor: _____

Location/Station#: _____

_____

Description of Spill (color, length, width, type): _____

_____

Type of Product: _____

Estimated Quantity: _____

Source of Spill (vehicle, machine, etc.): _____

_____

Describe initial containment procedures: _____

_____

_____

_____

_____

_____

Weather Conditions: _____

Note if spill reached any body of water: _____

Individuals notified of spill (include name, company, date, time and response): _____

_____

_____

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AMERICAN COLLOID COMPANY

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Arlington Heights, Illinois 60004-1404 • USA
(708) 392-4600 • Telex ITT 4330321
Fax (708) 506-6109

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MATERIAL SAFETY DATA SHEET - May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

PRODUCT NAME: PLUG-GEL

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Section I MANUFACTURER'S INFORMATION

Manufacturer's Name & Address:

American Colloid Company
1500 West Shure Drive
One North Arlington
Arlington Heights, Illinois 60004

Emergency Telephone Number: 708-392-4600
Telephone Number for Information: 708-392-4600
Date Prepared: July 5, 1990

Section II HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Hazardous Components (Specific Chemical Identity: Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Crystalline Quartz CAS# 14808-60-7	*	*	*	2-6%
Respirable Crystalline Quartz			NIOSH	
present (TWA)	0.1mg/m^3	0.1mg/m^3 TWA	50ug/m^3 TWA	<2%
proposed (TWA)		50ug/m^3 TWA	-	-
Nuisance Dust				
- Respirable	5mg/m^3	5mg/m^3	-	-
- Total Dust	15mg/m^3	10mg/m^3	-	-

* WARNING:
This clay product contains a small amount of crystalline silica which may cause delayed respiratory disease if inhaled over a prolonged period of time. Avoid breathing dust. Use NIOSH/MSHA approved respirator where TLV for crystalline silica may be exceeded. IARC Monographs on the evaluation of the Carcinogenic Risk of Chemicals to Humans (Volume 42, 1987) concludes that there is "limited evidence" of the carcinogenicity of crystalline silica to humans. IARC classification 2A.

PRODUCT IDENTIFICATION

Chemical Name: Bentonite Clay
Chemical Family: Natural Mineral, Montmorillonite
CAS No.: 1302-78-9
FORMULA: Naturally occurring hydrated aluminosilicate of sodium, calcium, magnesium, and iron
NFPA/HMIS: Health - 1, Fire - 0, Reactivity - 0, Specific Hazard - See Section VI
Dot Class: Not Regulated

AMERICAN COLLOID COMPANY

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PRODUCT NAME: PLUG-GEL

Section III PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point - Not Applicable
Vapor Pressure (mm Hg.) - Not Applicable
Vapor Density (AIR = 1) - Not Applicable
Solubility in Water - Negligible
Appearance and Odor - Pale grey to buff powder or granules, odorless

Specific Gravity (H_2O = 1) - 2.5
Melting Point - Not Applicable
Evaporation Rate (Butyl Acetate = 1) - Not Applicable

Section IV FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used) - Not Applicable
Flammable Limits - Not Applicable LEL- - UEL- -
Extinguishing Media - Not Applicable
Special Fire Fighting Procedures - Inorganic Mineral/Non-Flammable
Unusual Fire and Explosion Hazards - Not Applicable

Section V REACTIVITY DATA

Stability Unstable -
Stable - X
Conditions to Avoid - None Known

Incompatibility (Materials to Avoid) - None Known
Hazardous Decomposition or By-products - None Known

Hazardous Polymerization May Occur -
Will Not Occur - X
Conditions to Avoid - None Known

Section VI HEALTH HAZARD DATA

Route(s) of Entry: Inhalation? Yes Skin? No Ingestion? No

Health Hazards (Acute and Chronic) - May cause delayed respiratory disease if dust inhaled over a prolonged period of time.

Carcinogenicity: NTP? No IARC Monographs? Yes OSHA Regulated? No

IARC Monographs on the evaluation of the Carcinogenic Risk of Chemicals to Humans (volume 42, 1987) concludes that there is "limited evidence" of the carcinogenicity of crystalline silica to humans. IARC classification 2A.

Signs and Symptoms of Exposure - Excessive inhalation of dust may result in shortness of breath and reduced pulmonary function.

Medical Conditions Generally Aggravated by Exposure - Individuals with pulmonary and/or respiratory disease including but not limited to asthma and bronchitis should be precluded from exposure to dust.

Emergency and First Aid Procedures - Eyes - Flush with water.
- Gross inhalation of dust - Remove to fresh air; give oxygen or artificial respiration if necessary; get medical attention.

AMERICAN COLLOID COMPANY

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PRODUCT NAME: PLUG-GEL

Section VII PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken in Case Material is Released or Spilled - Vacuum if possible to avoid generating airborne dust. Avoid breathing dust. Wear an approved respirator. Avoid adding water, the product will become slippery when wet.

Waste Disposal Method - Follow federal, state and local regulations for solid waste.

Precautions to Be Taken in Handling and Storing - Avoid breathing dust, use NIOSH/MSHA approved respirator where TLV limits for Crystalline Silica may be exceeded.

Other Precautions - Slippery when wet.

Section VIII CONTROL MEASURES

Respiratory Protection (Specify Type) - OSHA standard 1910.134 or ANSI Z88.2-1980 specification.

Ventilation	- Local Exhaust	- As appropriate	Special	- None
	- Mechanical (General)	- As appropriate	Other	- None
Protective Gloves	- Not Required		Eye Protection	- Recommended
Other Protective Clothing or Equipment	- None			
Work/Hygienic Practices	- Use good housekeeping practices.			

MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name **SUPER GEL-X®**
Version # 16
Revision date 01-February-2012
CAS # 1302-78-9
Synonym(s) SMECTITE CLAY * BENTONITE
Manufacturer information CETCO
Drilling Products Group
2870 Forbs Avenue
Hoffman Estates, IL 60192 United States
safetydata@amcol.com
http://www.cetco.com/
General Information (800) 527-9948
CHEMTREC® (800) 424-9300

2. Hazards Identification

Potential health effects

Eyes Dust or powder may irritate eye tissue. Mild irritant to eyes (according to the modified Kay & Calandra criteria)

Inhalation Inhalation of dusts may cause respiratory irritation.

Ingestion No significant adverse effects are expected upon ingestion of the product.

Signs and symptoms None known.

3. Composition / Information on Ingredients

The manufacturer lists no ingredients as hazardous according to OSHA 29 CFR 1910.1200.

Constituents	CAS #	Percent
CALCIUM CARBONATE	471-34-1	
CRISTOBALITE	14464-46-1	<= 2
QUARTZ	14808-60-7	<= 8
SMECTITE GROUP MINERALS	1318-93-0	

Composition comments Bentonite is composed mainly of smectite group minerals but the composition is varied, as expected for a UVCB substance, and other mineral constituents will be present in small and varying amounts. These minor constituents are not relevant for classification and labelling. The purity of the product is 100% w/w. Impurities are not applicable for a UVCB substance.

4. First Aid Measures

First aid procedures

Eye contact No specific first aid measures noted. Flush thoroughly with water. If irritation occurs, get medical assistance.

Skin contact No specific first aid measures noted. Wash skin with soap and water. Get medical attention if irritation develops and persists.

Inhalation No specific first aid measures noted. Move to fresh air. Call a physician if symptoms develop or persist.

Ingestion No specific first aid measures noted. Rinse mouth thoroughly. Get medical attention if any discomfort occurs.

Notes to physician Provide general supportive measures and treat symptomatically.

General advice No hazards which require special first aid measures. Provide general supportive measures and treat symptomatically.

5. Fire Fighting Measures

Flammable properties The product is not flammable.

Extinguishing media

Suitable extinguishing media	Use any media suitable for the surrounding fires.
Unsuitable extinguishing media	Not applicable, non-combustible.

Protection of firefighters

Specific hazards arising from the chemical	None known. The product itself does not burn.
Protective equipment and precautions for firefighters	None known.
Fire fighting equipment/instructions	Material can be slippery when wet.

6. Accidental Release Measures

Personal precautions	No special precautions are necessary beyond normal good hygiene practices. See Section 8 for additional personal protection advice when handling this product.
Environmental precautions	No special environmental precautions required. Prevent further leakage or spillage if safe to do so.

7. Handling and Storage

Handling	Keep formation of airborne dusts to a minimum. Provide appropriate exhaust ventilation at places where dust is formed. In case of insufficient ventilation, wear suitable respiratory equipment.
Storage	Store in a dry area. Keep the container dry. No special restrictions on storage with other products.

8. Exposure Controls / Personal Protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

Constituents	Type	Value	Form
INERT OR NUISANCE DUSTS (SEQ250)	TWA	3 mg/m3	Respirable particles.
		10 mg/m3	Inhalable particles.

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Constituents	Type	Value	Form
INERT OR NUISANCE DUSTS (SEQ250)	PEL	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.

US. OSHA Table Z-3 (29 CFR 1910.1000)

Constituents	Type	Value	Form
INERT OR NUISANCE DUSTS (SEQ250)	TWA	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.
		50 mppcf	Total dust.
		15 mppcf	Respirable fraction.

Engineering controls	Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. If engineering measures are not sufficient to maintain concentrations of dust particulates below the OEL, suitable respiratory protection must be worn.

Personal protective equipment

Eye / face protection	Wear dust-resistant safety goggles where there is danger of eye contact.
Skin protection	No special protective equipment required. Normal work clothing (long sleeved shirts and long pants) is recommended.
Respiratory protection	Use a particulate filter respirator for particulate concentrations exceeding the Occupational Exposure Limit.
General hygiene considerations	Use good industrial hygiene practices in handling this material.

9. Physical & Chemical Properties

Appearance	Lump, granular or fine powder.
Physical state	Solid.

Form	Various.
Color	Various.
Odor	None.
Odor threshold	Not applicable.
pH	8.5 - 11
Vapor pressure	Not applicable.
Vapor density	Not applicable.
Boiling point	Not applicable.
Melting point/Freezing point	> 842 °F (> 450 °C) / Not applicable.
Solubility (water)	< 0.9 mg/l
Specific gravity	Not applicable.
Relative density	2.6 g/cm³
Flash point	Not applicable.
Flammability limits in air, upper, % by volume	Not applicable.
Flammability limits in air, lower, % by volume	Not applicable.
Auto-ignition temperature	Not applicable.
VOC	0 %
Viscosity	Not applicable.
Percent volatile	0 %
Partition coefficient (n-octanol/water)	Not applicable.
Flammability (Train fire)	Not applicable.
Bulk density	0.9 - 1.4 g/cm³
Molecular weight	Not applicable.
Molecular formula	UVCB Substance
Other data	
Decomposition temperature	> 932 °F (> 500 °C)
Explosive limit	Not applicable.
Explosivity	Not applicable.
Flame extension	Not applicable.
Flammability	Not applicable.
Flammability (flash back)	Not applicable.
Flammability (solid, gas)	This product is not flammable.
Flammability class	Not applicable.
Flash point class	Not flammable
Oxidising properties	None.
pH in aqueous solution	8.5 - 11
Viscosity temperature	Not applicable.

10. Chemical Stability & Reactivity Information

Chemical stability	Stable at normal conditions.
Conditions to avoid	Moisture.
Incompatible materials	None known.
Hazardous decomposition products	None.
Possibility of hazardous reactions	Will not occur.

11. Toxicological Information

Toxicological data

Product	Test Results
Bentonite (1302-78-9)	Acute Inhalation LC50 Rat: > 5.27 mg/l 4 hr OECD 436
	Acute Oral LD50 Rat: > 2000 mg/kg OECD 425

Sensitization	Not classified.
Acute effects	Not classified.
Carcinogenicity	The product does not meet the criteria for classification as hazardous according to EC Regulation 1272/2008 and Directive 67/548/EC as amended. The product contains less than 1% w/w RCS (respirable crystalline silica).
Skin corrosion/irritation	Not classified.
Mutagenicity	Not classified.
Reproductive effects	Not classified.
Symptoms and target organs	None known.

12. Ecological Information

Ecotoxicological data

Product	Test Results
Bentonite (1302-78-9)	EC50 Coon stripe shrimp (Pandalus danae): 24.8 mg/l 96 hours
	EC50 Daphnia: > 100 mg/l 48 hours
	EC50 Dungeness or edible crab (Cancer magister): 81.6 mg/l 96 hours
	EC50 Freshwater algae: > 100 mg/l 72 hours
	LC50 Freshwater fish: 16000 mg/l 96 hours
	LC50 Marine water fish: 2800 - 3200 mg/l 24 hours
	LC50 Rainbow trout,donaldson trout (Oncorhynchus mykiss): 19000 mg/l 96 hours

Persistence and degradability	Not relevant for inorganic substances
Bioaccumulation / Accumulation	Will not bio-accumulate.
Partition coefficient	Not applicable.

13. Disposal Considerations

Disposal instructions	Dispose in accordance with all applicable regulations.
Waste from residues / unused products	Dispose of in accordance with local regulations.
Contaminated packaging	Store containers and offer for recycling of material when in accordance with the local regulations.

14. Transport Information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

15. Regulatory Information

US federal regulations

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2)

Not regulated

DEA Essential Chemical Code Number

Not regulated

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Not regulated

DEA Exempt Chemical Mixtures Code Number

Not regulated

CERCLA (Superfund) reportable quantity

None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - No Delayed Hazard - No Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No
Section 302 extremely hazardous substance	No
Section 311 hazardous chemical	No
Food and Drug Administration (FDA)	Total food additive Direct food additive GRAS food additive

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

16. Other Information

Recommended restrictions	None known.
Further information	This safety datasheet only contains information relating to safety and does not replace any product information or product specification.
HMIS® ratings	Health: 1 Flammability: 0 Physical hazard: 0
NFPA ratings	Health: 1 Flammability: 0 Instability: 0
Disclaimer	The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The manufacturer expressly does not make any representations, warranties, or guarantees as to its accuracy, reliability or completeness nor assumes any liability, for its use. It is the user's responsibility to verify the suitability and completeness of such information for each particular use. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Issue date	20-November-2007
This data sheet contains changes from the previous version in section(s):	This document has undergone significant changes and should be reviewed in its entirety.

MATERIAL SAFETY DATA SHEET
DRISPAC POLYMER (All grades)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME: DRISPAC POLYMER (All grades)

CHEMICAL CLASS: Cellulosic polymer.

APPLICATIONS: Oil well drilling fluid additive. Fluid Loss reducer

EMERGENCY TELEPHONE: 281-561-1600

SUPPLIER: Supplied by a Business Unit of
M-I L.L.C.
P.O. Box 42842, Houston, Texas 77242-2842
See cover sheet for local supplier.

TELEPHONE: 281-561-1509
FAX: 281-561-7240

CONTACT PERSON: Sam Hoskin - Manager, Occupational Health

2. COMPOSITION, INFORMATION ON INGREDIENTS

INGREDIENT NAME:	CAS No.:	CONTENTS :	EPA RQ:	TPQ:
Cellulosic Polymer		100 %		

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

CAUTION! MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. Avoid contact with eyes, skin and clothing. Avoid breathing airborne product. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

May form explosive dust-air mixtures. This product is a/an white powder. Slippery when wet. No significant immediate hazards for emergency response personnel are known.

ACUTE EFFECTS:
HEALTH HAZARDS, GENERAL:

Particulates may cause mechanical irritation to the eyes, nose, throat and lungs. Particulate inhalation may lead to pulmonary fibrosis, chronic bronchitis, emphysema and bronchial asthma. Dermatitis and asthma may result from short contact periods.

INHALATION: May be irritating to the respiratory tract if inhaled.

INGESTION: May cause gastric distress, nausea and vomiting if ingested.

SKIN: May be irritating to the skin.

EYES: May be irritating to the eyes.

CHRONIC EFFECTS:

10021 - DRISPAC POLYMER (All grades)

CARCINOGENICITY:
IARC: Not listed. OSHA: Not regulated. NTP: Not listed.

ROUTE OF ENTRY:
Inhalation. Skin and/or eye contact.

TARGET ORGANS:
Respiratory system, lungs. Skin. Eyes.

4. FIRST AID MEASURES

GENERAL: Persons seeking medical attention should carry a copy of this MSDS with them.

INHALATION: Move the exposed person to fresh air at once. Perform artificial respiration if breathing has stopped. Get medical attention.

INGESTION: Drink a couple of glasses water or milk. Do not give victim anything to drink of he is unconscious. Get medical attention.

SKIN: Wash skin thoroughly with soap and water. Remove contaminated clothing. Get medical attention if any discomfort continues.

EYES: Promptly wash eyes with lots of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

5. FIRE FIGHTING MEASURES

AUTO IGNITION TEMP. (°F): N/D
FLAMMABILITY LIMIT - LOWER(%): N/D
FLAMMABILITY LIMIT - UPPER(%): N/D

EXTINGUISHING MEDIA:
Carbon dioxide (CO2). Dry chemicals. Foam. Water spray, fog or mist.

SPECIAL FIRE FIGHTING PROCEDURES:
No specific fire fighting procedure given.

UNUSUAL FIRE & EXPLOSION HAZARDS:
Dust in high concentrations may form explosive mixtures with air.

HAZARDOUS COMBUSTION PRODUCTS:
Irritating gases/vapors/fumes. Oxides of: Carbon.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS:
Wear proper personal protective equipment (see MSDS Section 8).

SPILL CLEAN-UP PROCEDURES:
Carefully sweep up and put in closed containers. Avoid making dust. Do not contaminate drainage or waterways. Repackage or recycle if possible.

7. HANDLING AND STORAGE

HANDLING PRECAUTIONS:
Avoid handling causing generation of dust. Wear full protective clothing for prolonged exposure and/or high concentrations. Eye wash and emergency shower must be available at the work place. Wash hands often and change clothing when needed. Provide good ventilation. Mechanical ventilation or local exhaust ventilation is required.

STORAGE PRECAUTIONS:
Store at moderate temperatures in dry, well ventilated area. Keep in original container.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

		OSHA PEL:		ACGIH TLV:		OTHER:		
INGREDIENT NAME:	**CAS No.:**	**TWA:**	**STEL:**	**TWA:**	**STEL:**	**TWA:**	**STEL:**	**UNITS:**
Cellulosic Polymer		15		10				mg/m3 total dust

INGREDIENT COMMENTS:
Exposure limits for Particulates Not Otherwise Classified (PNOC) apply to dust/mist/aerosol of the proprietary ingredients this product. TLV: 3 mg/m3 resp dust; PEL: 5 mg/m3 resp. dust.

PROTECTIVE EQUIPMENT:

ENGINEERING CONTROLS:
Use appropriate engineering controls such as, exhaust ventilation and process enclosure, to reduce air contamination and keep worker exposure below the applicable limits.

VENTILATION: Supply natural or mechanical ventilation adequate to exhaust airborne product and keep exposures below the applicable limits.

RESPIRATORS: Use at least a NIOSH-approved N95 half-mask disposable or reuseable particulate respirator. In work environments containing oil mist/aerosol use at least a NIOSH-approved P95 half-mask disposable or reuseable particulate respirator.

PROTECTIVE GLOVES:
Use suitable protective gloves if risk of skin contact.

EYE PROTECTION:
Wear dust resistant safety goggles where there is danger of eye contact.

PROTECTIVE CLOTHING:
Wear appropriate clothing to prevent repeated or prolonged skin contact.

HYGIENIC WORK PRACTICES:
Wash promptly with soap and water if skin becomes contaminated. Change work clothing daily if there is any possibility of contamination.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE:	Powder, dust.		
COLOR:	White.		
ODOR:	Odorless or no characteristic odor.		
SOLUBILITY DESCRIPTION:	Soluble in water.		
DENSITY/SPECIFIC GRAVITY (g/ml):	1.6	TEMPERATURE (°F):	68
BULK DENSITY:	34.2 lb/cu ft; 548 kg/m3		
VAPOR DENSITY (air=1):	N/A		
VAPOR PRESSURE:	N/A	TEMPERATURE (°F):	
pH-VALUE, DILUTED SOLUTION:	6.5 - 8.0	CONCENTRATION (%,M):	1%

10021 - DRISPAC POLYMER (All grades)

10. STABILITY AND REACTIVITY

STABILITY: Normally stable.

CONDITIONS TO AVOID:
Avoid heat.

HAZARDOUS POLYMERIZATION:
Will not polymerize.

POLYMERIZATION DESCRIPTION:
Not relevant.

MATERIALS TO AVOID:
Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS:
No specific hazardous decomposition products noted.

11. TOXICOLOGICAL INFORMATION

Component: **Cellulosic Polymer**

TOXIC DOSE - LD 50: >25,000 mg/kg (oral rat)

12. ECOLOGICAL INFORMATION

LC 50, 96 HRS, FISH, mg/l: >21,000

ACUTE AQUATIC TOXICITY:
This product is approved for use under the U.S. Environmental Protection Agency (EPA) Region IX (California) General NPDES Permit which regulates offshore discharges of drilling fluids. Contact M-I's Environmental Affairs Department for more information.

This product passes the mysid shrimp toxicity test required by the U.S. Environmental Protection Agency (EPA) Region VI (Gulf of Mexico) NPDES Permit, which regulates offshore discharge of drilling fluids, when tested in a standard drilling fluid. Contact M-I's Environmental Affairs Department for more information.

13. DISPOSAL CONSIDERATIONS

WASTE MANAGEMENT:
This product does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to determine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc, may render the resulting materials hazardous.

DISPOSAL METHODS:
Recover and reclaim or recycle, if practical. Should this product become a waste, dispose of in a permitted industrial landfill. Ensure that containers are empty by RCRA criteria prior to disposal in a permitted industrial landfill.

14. TRANSPORT INFORMATION

U.S. DOT:
U.S. DOT CLASS: Not regulated.

CANADIAN TRANSPORT:
TDGR CLASS: Not regulated.

SEA TRANSPORT:
IMDG CLASS: Not regulated.

AIR TRANSPORT:
ICAO CLASS: Not regulated.

15. REGULATORY INFORMATION

REGULATORY STATUS OF INGREDIENTS:

NAME:	CAS No:	TSCA:	CERCLA:	SARA 302:	SARA 313:	DSL(CAN):
Cellulosic Polymer		Yes	No	No	No	Yes

US FEDERAL REGULATIONS:
WASTE CLASSIFICATION: Not a hazardous waste by U.S. RCRA criteria. See Section 13.

REGULATORY STATUS: This Product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):

SECTION 313: This product does not contain toxic chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR Part 372.

SARA 311 Categories:
1: Immediate (Acute) Health Effects.

The components of this product are listed on or are exempt from the following international chemical registries:
TSCA (U.S.)
DSL (Canada)
ENCS (Japan)
AICS (Australia)

STATE REGULATIONS:
STATE REGULATORY STATUS: This product or its components, if a mixture, is subject to following regulations (Not meant to be all inclusive - selected regulations represented):.

None.

CANADIAN REGULATIONS:
REGULATORY STATUS: This Material Safety Data Sheet has been prepared in compilance with the Controled Product Regulations.

Canadian WHMIS Classification: Not a Controlled Product.

16. OTHER INFORMATION

NPCA HMIS HAZARD INDEX: 1 Slight Hazard
FLAMMABILITY: 1 Slight Hazard
REACTIVITY: 0 Minimal Hazard
NPCA HMIS PERS. PROTECT. INDEX: E - Safety Glasses, Gloves, Dust Respirator

10021 - DRISPAC POLYMER (All grades)

USER NOTES:	N/A = Not applicable N/D = Not determined
INFORMATION SOURCES:	OSHA Permissible Exposure Limits, 29 CFR 1910, Subpart Z, Section 1910.1000, Air Contaminants. ACGIH Threshold Limit Values and Biological Exposure Indices for Chemical Substances and Physical Agents (latest edition). Sax's Dangerous Properties of Industrial Materials, 9th ed., Lewis, R.J. Sr., (ed.), VNR, New York, New York, (1997). Product information provided by the commercial vendor(s).
PREPARED BY:	Sam Hoskin/bb
REVISION No./Repl. MSDS of:	2/January 12, 1998
MSDS STATUS:	Approved.
DATE:	January 29, 2001

DISCLAIMER:
MSDS furnished independent of product sale. While every effort has been made to accurately describe this product, some of the data are obtained from sources beyond our direct supervision. We cannot make any assertions as to its reliability or completeness; therefore, user may rely on it only at user's risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditiions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. Additional information will be furnished upon request to assist the user; however, no warranty, either expressed or implied, nor liability of any nature with respect to this product or to the data herein is made or incurred hereunder.

Black Hills Bentonite, LLC MATERIAL SAFETY AND TRANSPORTATION DATA SHEET

SECTION 1 PRODUCT IDENTIFICATION

MANUFACTURERS NAME
Black Hills Bentonite, a Limited Liability Company
Trade Name: Bentonite Plug 3/8 & 3/4

TELEPHONE NO.
(307) 265-3740

ADDRESS
P.O. Box 9, Mills, WY 82644

CHEMICAL NAME AND SYNONYMS
Hydrous Silicate of Alumina / Wyoming Sodium Bentonite/Sodium Montmorillonite
CAS No. 1302-78-9

SECTION 2 HAZARDOUS INGREDIENTS

CAS #	Component	Percentage	Exposure Limit
14808-60-7	Crystalline Silica in the form of Quartz	2-6%	PEL - See Below TLV - 0.05 mg/m^3 TWA (respirable fraction) MSHA - See Below

OSHA PEL and MSHA Exposure Limit for Crystaline Silica Quartz: $\frac{10\text{mg/m}^3}{\%\ \text{Silica} + 2}$ (Respirable)

National Institute for Occupational Safety and Health (NIOSH) has recommended that the permissible exposure limit be changed to 50 micrograms respirable free silica per cubic meter of air (0.05 mg/m^3) as determined by a full shift sample up to 10 hour working day, 40 hours per week. The 1974 NIOSH Criteria for a recommended Standard for Occupational Exposure to Crystalline Silica should be consulted for more detailed information.

PEL means OSHA Permissible Exposure Limit.
TLV means American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value.
MSHA means Mine Safety and Health Administration Exposure Limit.

TWA means 8 hour time weighted average.
Note: The Permissible Exposure Limits (PEL) reported above are the pre-1989 limits that were reinstated by OSHA June 30, 1993 following a decision by the 11th Circuit Court of Appeals. Federal OSHA is now enforcing these PELs. Be aware that more restrictive exposure limits may be enforced by some states, agencies or other authorities.

SECTION 3 PHYSICAL DATA

BOILING POINT (°F) Not Applicable	SPECIFIC GRAVITY (H_2O = 1) 2.6
VAPOR PRESSURE (mm Hg) Not Applicable	VAPOR DENSITY (AIR = 1) Not Applicable
EVAPORATION RATE Not Applicable	SOLUBILITY IN WATER Negligible
APPEARANCE AND ODOR Yellow, Blue, Brown granules or powder. Earthy odor.	DENSITY @ 20° C: UNCOMPACTED: 71 lbs/cubic foot

SECTION 4 HAZARDOUS MATERIALS IDENTIFICATION

__1__ Health Hazard
__0__ Flammability
__0__ Reactivity

DEGREE OF HAZARD
4 = EXTREME
3 = High
2 = Moderate
1 = Slight
0 = Insignificant

SKIN	EYE	INHALATION
Potential irritant.	Potential irritant.	Irritation to lungs, nose, and throat

SECTION 5 FIRE AND EXPLOSION DATA

FLASH POINT	FLAMMABLE LIMITS
Not Applicable	Non Flammable

Extinguishing Media: Use extinguishing media appropriate to the surrounding fire.

Special Protective Equipment: None other than those suitable for the surrounding fire conditions.

Unusual Fire/Explosion Hazards: None known.

SECTION 6 EMERGENCY FIRST AID PROCEDURES

EYES:	SKIN:
Flush with water	Wash with soap and water

If inhaled and effects occur, move to fresh air. If breathing is irregular administer oxygen.

SECTION 7 REACTIVITY DATA

CONDITIONS CONTRIBUTING TO INSTABILITY: Stable	HAZARDOUS POLYMERIZATION: Will not occur.
HAZARDOUS DECOMPOSITION PRODUCTS: None	

SECTION 8 SPILL OR LEAK PROCEDURES

STEPS TO TAKE IF MATERIAL IS RELEASED OR SPILLED
If uncontaminated, sweep up or collect, and reuse product. Product becomes slippery when wet.

WASTE DISPOSAL METHOD
Dispose of in accordance with all Federal, State and Local regulations.

NEUTRALIZING CHEMICALS
Not Applicable

SECTION 9 SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION
Use NIOSH approved mechanical filter respirator for nontoxic dusts if dust concentration exceeds 10mg/m^3

VENTILATION
Sufficient to keep dust levels below the TLV for crystalline silica.

PROTECTIVE GLOVES
General duty work gloves.

EYE PROTECTION
If high dust conditions exist, tight fitting goggles are recommended.

OTHER PROTECTIVE EQUIPMENT
Eyewash

SECTION 10 SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Store out of the weather. Product becomes slippery when wet. Avoid contact with water in walk areas.

OTHER PRECAUTIONS

PROPER SHIPPING NAME Not Regulated	PLACARDS None	HAZARD CLASS Not Hazardous
REPORTABLE QUANTITY None	HAZARDOUS SUBSTANCE None	ID NUMBER None

SECTION 11 TOXICOLOGICAL INFORMATION

Skin Irritation: Not irritant to skin.

Eyes Irritation: Mild irritation to eyes (according to the modified Kay & Calandra criteria).

Acute Oral Toxicity: By analogy to similar materials, the acute LD50 (rat) is expected to be >5000 mg/kg.

Carcinogenicity: IARC, NTP, OSHA or ACGIH does not list Bentonite as a carcinogen.

Reproductive Toxicity: No data for product. No effects anticipated

Teratogencity: No data for product. Not effects anticipated.

CARCINOGENICITY - SEE ROUTES OF EXPOSURE AND EFFECTS (BELOW)

Inhalation: Breathing prolonged and excessive amounts of Bentonite dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may have the following serious chronic health effects:

Pneumoconiosis: Excessive inhalation of respirable dust may cause pneumonoconiosis, a respiratory disease, which can result in delayed, progressive, disabling and sometimes fatal lung injury. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with pneumoconiosis are predisposed to develop tuberculosis.

Cancer Status: The International Agency for Research on Cancer has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (Group 1 - carcinogenic to humans). Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (published in June 1997) in conjunction with the use of these materials. The National Toxicology Program classifies respirable crystalline silica as "known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2).

Other Data with Possible Relevance to Human Health:

There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by fibrosis of the lungs, skin and other internal organs) and kidney disease.

For further information consult "Adverse Effects of Crystalline Silica Exposure" published by the American Thoracic Society Medical Section of the American Lung

Association, American Journal of Respiratory and Critical Care Medicine Volume 155, pages 761-768, 1997.

SECTION 12 REGULATORY INFORMATION

SARA requires the submission of annual reports of toxic chemicals that appear in 40 CFR 372 (for SARA 313). This information must be included in all MSDS that are re copied and distributed for this material. Components present in this product at a level which could require reporting under the statute are:

Chemical: NONE
CAS #: N/A

Toxic Substances Control Act: The ingredients of this product are on the TSCA inventory.

Quartz is a Canadian WHMIS (Workplace Hazardous Material Information System) Ingredient Disclosure List, Massachusetts Substance List, New Jersey Right to Know Hazardous Substance List, and Pennsylvania Hazardous Substance List.

SECTION 13 ECOLOGICAL INFORMATION

No specific adverse effect known.

SECTION 14 TRANSPORT INFORMATION

DOT – Proper Shipping Name: Not a DOT/MO Hazardous Material

Road Transport ADR/RID: Not a dangerous substance as defined in the above regulations.

Inland Navigation AND/ADNR: Not a dangerous substance as defined in the above regulations.

Maritime Transport IMDG: Not a dangerous substance as defined in the above regulations.

Air Transport ICAO/IATA: Not a dangerous substance as defined in the above regulations.

SECTION 15 REGULATORY INFORMATION

SARA 311/312: Hazard Categories for SARA Section 311/312 Reporting: Chronic Health

SARA 313: This Product contains the following chemicals subject to annual release reporting requirements under the SARA Section 313 (40 CFR 372): None

CERLA Section 103 Reportable Quantity: None

California Proposition 65: In 1999, after extensive analysis, the California Office of Health Hazard Assessment determined that there is no adverse health risk associated with the occurrence of crystalline silica in sorbent mineral based pet litter. This determination exempts cat litter from the proposition 65 warning requirements.

Toxic Substances Control Act: All of the components of this product are listed on the EPA TSCA Inventory or are exempt from the notification requirements.

European inventory of Commercial Chemical Substances: All the components of this product are listed on the EINECS Inventory or exempt from the notification requirements. (The EINECS number for Quartz: 231-545-5.)

Canadian Environmental Protection Act: All the components of this product are listed on the Canadian Domestic Substances List or exempt from the notification requirements.

Japan MITI: all the components of this product are existing chemical substances as defined in the Chemical Substance Control Law.

Australian Inventory of Chemical Substances: All the components of this product are listed on the AICS Inventory or exept from the notification requirements.

Canadian WHMIS Classification: This product contains crystalline silica (respirable), classified as a Class D, Division 2, Subdivision A substance.

SECTION 16 OTHER INFORMATION

Training: Workers (and your customers or users in case of resale) must be informed of the presence of crystalline silica and the potential hazards. Provide appropriate training in the proper use and handling of the product as required under applicable regulations.

Liability: Such information is the best of Black Hills Bentonite's knowledge and belief accurate and reliable as the date indicted. However, no representation, warranty or guarantee is made to its accuracy, reliability or completeness. It is the users' responsibility to satisfy itself as to the suitability and completeness of such information for their particular use.

BLACK HILLS BENTONITE, LLC. Update: 4/29/11

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